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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,986	08/20/2003	Peter H. McDonald	21295	4994

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EXAMINER	
MCDONALD, RODNEY GLENN	
ART UNIT	**PAPER NUMBER**
1795	

MAIL DATE	DELIVERY MODE
10/17/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/643,986	MCDONALD, PETER H.	
	Examiner	Art Unit	
	Rodney G. McDonald	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 3-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunlop et al. (U.S. Pat. 6,030,514) in view of Marton et al. (U.S. PG Pub. 2003/0059640)

Regarding claim 1, Dunlop et al. teach a method of dry treating a target surface prior to using the target for sputtering (i.e. subsequent use). Dunlop teach subjecting at least a portion of the target (i.e. expose surface) to a non-mechanical surface treatment step to produce a target surface (i.e. exposed surface) treat portion whereby at least one of impurities present on the target surface treated portion is removed and a surface area of the target surface treated portion is reduced. (Column 8 lines 37-45) The non-mechanical surface treatment step comprises surface treating the portion of the target by one of ionic cleaning, ionic milling, ***sputtering***, chemical etching, chemical polishing, electrolytic polishing, electrolytic etching, laser ablation, electron ablation, or ***combinations thereof***. (Column 8 lines 62-67) The target is removed from the surface treatment process (i.e. sputtering chamber) and is prepared and packed for subsequent use in a sputtering deposition process. (Column 8 lines 46-51; Column 5 lines 10-15)

Regarding claim 1, Dunlop et al. teach that the burn-in time can be reduced by at least 10%. (Column 7 lines 30-32)

Regarding claim 6, Dunlop et al. teach the surface treated portion of the target assembly is placed in an enclosure to protect it during storage and shipment. (Column 8 lines 46-51)

Regarding claim 7, Dunlop et al. teach the enclosure is metallic and the metallic enclosure containing the target assembly is further placed into a different enclosure. (Column 8 lines 46-51)

Regarding claim 8, Dunlop et al. the target materials include aluminum, titanium, transition metals, refractory metals, silicides, indium tin oxide, composites, bonded assemblies or combinations thereof. (Column 8 lines 16-20)

The differences between Dunlop and the present claims is that the specifics of the treatment method prior to packaging is not discussed (Claims 1, 3), the target surface being treated in an inert atmosphere is not discussed (Claim 4), the inert atmosphere being argon is not discussed (Claim 5).

Regarding claims 1, 3, Marton et al. teach sputtering to condition or clean the surface of a target prior to using the target for deposition. (Page 5 paragraph 0050) The target conditioning is performed by utilizing a magnetron to produce a plasma for about 10 to 40 minutes. The magnetron power is about between 0.1 kW to 1 kW. Ar gas is feed regulated to adjust the Ar gas pressure to maintain a constant cathode voltage. (Page 7 paragraph 0074)

Regarding claims 4, 5, Marton et al. teach that Ar gas can be used as the inert gas. (Page 7 paragraph 0074)

The motivation for utilizing the features of Marton et al. is that it allows for conditioning or cleaning the target. (Page 7 paragraph 0074)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dunlop by utilizing the features of Marton et al. because it allows for conditioning or cleaning of the target.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dunlop et al. in view of Marton et al. as applied to claims 1 and 3-8 above, and further in view of Ding et al. (US PGPUB 2003/0089601).

The difference not yet discussed is the magnetron to be rotatable and the magnetic component to be disposed on less than a 180-degree arc measured at the axis of rotation of the apparatus so as to produce a rotatable sputtering ion plasma on the target. (Claim 2)

Regarding claim 2, Ding discloses a sputtering apparatus comprising a rotating magnetron system comprising a magnetron that comprises less than 180 degrees (Figure 1) with corresponding side magnets (Figure 1) that provides the benefit of smaller rotating magnetron is that the target power density can be maximized and results in uniform target erosion [0017].

The motivation for utilizing the features of Ding et al. is that it allows for maximizing target power density that results in uniform target density. (Paragraph 0017)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Ding et al. because it allows for maximizing target power density that results in uniform target density.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dunlop et al. in view of Marton et al. and Ding as applied to claims 1-8 above, and further in view of Arai et al. (U.S. Pat. 6,187,457).

The difference not yet discussed is the use of a FeNdB magnets.

Arai et al. teach that using a FeNdB magnet component in a magnetron is common in the art and therefore obvious (col. 6, 1. 50-57).

The motivation for utilizing the features of Arai et al. is that it allows for utilizing a magnetron for sputtering. (Column 6 lines 50-57)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Arai et al. because it allows for utilizing a magnetron for sputtering.

Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dunlop et al. (U.S. Pat. 6,030,514) in view of Marton et al. (U.S. PG Pub. 2003/0059640) and Pavate et al. (U.S. Pat. 6,001,227).

Regarding claim 10, Dunlop et al. teach a method of dry treating a target surface prior to using the target for sputtering (i.e. subsequent use). Dunlop teach subjecting at least a portion of the target (i.e. expose surface) to a non-mechanical surface treatment step to produce a target surface (i.e. exposed surface) treat portion whereby at least one of impurities present on the target surface treated portion is removed and a surface

area of the target surface treated portion is reduced. (Column 8 lines 37-45) The non-mechanical surface treatment step comprises surface treating the portion of the target by one of ionic cleaning, ionic milling, ***sputtering***, chemical etching, chemical polishing, electrolytic polishing, electrolytic etching, laser ablation, electron ablation, or ***combinations thereof***. (Column 8 lines 62-67) The target is removed from the surface treatment process (i.e. sputtering chamber) and is prepared and packed for subsequent use in a sputtering deposition process. (Column 8 lines 46-51; Column 5 lines 10-15)

Regarding claim 10, Dunlop et al. teach that the burn-in time can be reduced by at least 10%. (Column 7 lines 30-32)

Regarding claim 12, Dunlop et al. the target materials include aluminum, titanium, transition metals, refractory metals, silicides, indium tin oxide, composites, bonded assemblies or combinations thereof. (Column 8 lines 16-20)

The differences between Dunlop and the present claims is that the specifics of the treatment method prior to packaging is not discussed (Claims 10, 11) and the steps of assembling the target assembly into a sputtering apparatus to coat a substrate and sputtering the target to burn-in the target assembly wherein the burn-in time is reduced by at least 10% compared to an untreated target is not discussed (Claim 10).

Regarding the specifics of the treatment method prior to packaging of claims 10, 11, Marton et al. teach sputtering to condition or clean the surface of a target prior to using the target for deposition. (Page 5 paragraph 0050) The target conditioning is performed by utilizing a magnetron to produce a plasma for about 10 to 40 minutes. The magnetron power is about between 0.1 kW to 1 kW. Ar gas is feed regulated to

adjust the Ar gas pressure to maintain a constant cathode voltage. (Page 7 paragraph 0074)

The motivation for utilizing the features of Marton et al. is that it allows for conditioning or cleaning the target. (Page 7 paragraph 0074)

Regarding the steps of assembling the target assembly into a sputtering apparatus to coat a substrate and sputtering the target to burn-in the target assembly wherein the burn-in time is reduced by at least 10% compared to an untreated target of claim 10, Dunlop et al. already implies placing the target in a sputtering chamber and burning-in the target. The burn-in time is reduced by at least 10%. (See Dunlop et al. discussed above; Dunlop et al. Column 7 lines 30-32) However, Pavate et al. explicitly teach surface treatment and packaging and then installing the target into a sputtering chamber as required by applicants step (e). The target is burned-in as required by Applicant's step (f). Substrates are coated. (Column 11 lines 46-67; Column 12 lines 1-26)

The motivation for utilizing the features of Pavate et al. is that it allows for preventing blob formation. (Column 2 lines 30-31)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Dunlop et al. by utilizing the features of Marton et al. and Pavate et al. because it allows for conditioning or cleaning the target and for preventing blob formation.

Response to Arguments

Applicant's arguments filed July 29, 2008 have been fully considered but they are not persuasive.

In response to the argument that Dunlop et al. do not teach the sputtering conditions for burn-in, it is argued that Marton et al. teach the sputtering processing conditions for sputtering the surface of a target. (See Marton et al. discussed above)

In response to the argument that Marton et al. do not teach reducing the burn-in time by at least 10%, it is argued that Dunlop et al. teach the reduction of burn-in time by at least 10%. Particularly Dunlop et al. state that the burn in time is reduced from 5-6 hours to less than 1 hour. (See Dunlop et al. discussed above)

In response to the argument that Marton et al. do not teach conditioning dedicated regions of a sputter target surface prior to burn-in, it is argued that the claims do not require particular dedicated regions to be treated but that the surface of the target is treated. Dunlop et al. and Marton et al. teach the surface of the target being treated. (See Dunlop et al. and Marton et al. discussed above)

In response to the argument that Marton et al. do not teach a separate and discrete step prior to performing a deposition process for conditioning, it is argued that Dunlop et al. teach a separate discrete step for burn-in prior to using the target for sputtering. (See Dunlop et al. discussed above)

In response to the argument that Ding et al., Arai et al. and Pavate et al. does not cure the deficiencies of Marton et al. and Dunlop et al., it is argued as discussed above

that Marton et al. in combination with Dunlop et al. teach burning in the target prior to using the target for sputtering. (See Marton et al. and Dunlop et al. discussed above)

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-Th with every Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rodney G. McDonald/
Primary Examiner, Art Unit 1795

Rodney G. McDonald
Primary Examiner
Art Unit 1795

RM
October 16, 2008